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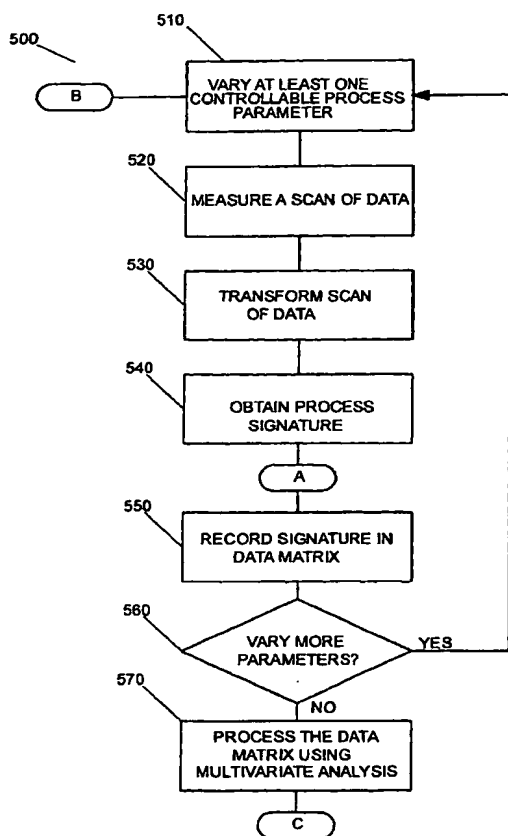
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[Continued on next page]

(54) Title: METHOD OF FAULT DETECTION FOR MATERIAL PROCESS SYSTEM



(57) Abstract: A method for material processing utilizing a material processing system to perform a process. The method performs a process (510), measures a scan of data (520), and transforms the data scan (530) into a signature (540) including at least one spatial component. The scan of data (530) can include a process performance parameter such as an etch rate, an etch selectivity, a deposition rate, a film property, etc. The signature (540) can be stored (550), and compared with either a previously acquired signature or with an ideal signature (560). If at least one spatial component substantially deviates from the reference spatial component, then a process fault has potentially occurred. If the cumulative deviation of all spatial components or a select group of components substantially deviates from a reference set of spatial components, then a process fault has potentially occurred.

WO 03/058699 A1



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/38989

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 21/306; C23F 1/00; B05C 11/00; C23C 14/32

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 204/192.13, 298.03; 156/345.25, 345.26, 345.27, 345.28; 216/59, 60, 61; 427/8, 9, 10; 118/663, 664, 665

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y -- A	US 6,232,134 B1 (FARBER et al) 15 May 2001, See Abstract, Column 3 lines 9-68; Column 4 lines 1-51; Column 6 lines 44-68; Column 7 lines 1-17, lines 57-68; Column 8 lines 1-41; Column 9 lines 11-35; Column 10 lines 21-45; Column 11 lines 45-68; Column 12 lines 1-7; Column 12 lines 41-46.	1-4, 10-16, 19 ----- 6-9, 17, 18, 20-22 ----- 5
X -- Y -- A	US 5,711,849 A (FLAMM et al) 27 January 1998, See Abstract; Column 5 lines 16-37; Column 7 lines 22-41; Column 8 lines 44-61.	1-4, 10-16, 19 ----- 6-8, 17, 18, 20-22 ----- 5
A	US 5,786,023 A (MAXWELL et al) 28 July 1998, See Abstract; Column 12 lines 35-68.	1-22

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"G"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,009,485 A (HALL) 23 April 1991, See Abstract; Column 15 lines 4-52; Column 16 lines 1-17.	1-22

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US CL :

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